

Space-Based X-Ray Laser Weapons Platforms with Zero Beam Divergence: A New Role for Soliton Waves

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Introduction

The ability to "zap" one's enemies from space has long been a dream of comic book writers and real-world physicists, alike. X-Rays require copious amounts of electricity to generate and are difficult to focus. In recent years, advancements have been made that would allow for the creation of powerful space-based X-Ray lasers capable of causing damage to buildings and ships or even inducing cancers in specific human targets on the surface or the Earth, provided that a few additional engineering hurdles are overcome.

Abstract

When it comes to high-energy beams of electrons, be it very intense visible light or X-Rays of any quantity, these beams of light, no matter how well-focused at the aperture of the laser, tend to self-scatter. This is the reason why when individual photons are sent through a piece of cardboard with two slits, they travel in a straight line and why when they are accompanied by many other photons, they are capable of striking areas blocked by the cardboard.

The question then becomes one of how to maintain X-Ray beam focus over distances of hundreds of miles to achieve the desired result. The answer, I propose, lies in soliton waves.

By combining space-based soliton emitters that are, for the moment, only being used as a ocean and ground-penetrating radar tool with X-Ray lasers in a single platform, we can generate self-confining light beams.

Picture a soliton wave as it exits the aperture of a soliton emitter. In some ways, it is like a tablecloth, completely flat and flying through space flat side first rather than edge-wise. If it were a tablecloth, it wouldn't be very aerodynamic, but aerodynamics, thankfully, do not come into play here. Soliton waves are capable of penetrating water because complementary spins of electrons in sections of that "tablecloth" that resemble pie slices alternate in direction between South-North and North-South. This prevents phasing, causing the electrons in the wave not to have a property of frequency or phase, but does mean that they have the quality of constant spin, something most EM lacks. This constant spin on its own axis means that electrons that comprise soliton waves never have a chance to resonate with air or water and are primarily reflected only by solid objects, meaning they can be used to detect solid objects well-beneath the surface of the ocean or the Earth.

As revolutionary as that capability is, like most technologies, it has at least one alternative application. In this case, I want to explore the use of soliton waves as traveling companions for X-Ray beams.

Imagine an X-Ray laser emitter positioned in the exact center of a soliton emitter. A large ring of superconducting magnets of alternating polarity doing their normal work of shaping an ordinary radar beam into a soliton wave and, cutting right through the center of all of that, is a high-energy X-Ray component.

If you've ever seen a photo of a fighter jet at the moment it breaks the sound barrier, you can imagine the spatial relationship between the soliton component of my proposed wave and the X-Rays at the center.

In any intense beam of light, particularly X-Ray light, electrons are constantly influencing each other and causing the beam to self-diverge. EM can both self-repel and self-attract depending upon chance combinations of electron spin, but the average result is that high-energy beams with densely-packed photons will diverge and that the higher the frequency of the light, the more likely waves are to cancel each other out or be deflected entirely.

In a soliton wave, if we imagine it like a tablecloth, we can cut that tablecloth into pie-slices. All of the spins of the constituent electrons are either North-South or South-North, but regardless of that, their magnetic force is always oriented toward the exact center of that tablecloth. Any sufficiently narrow beam of EM traveling at the center of that field would tend to be corralled back into the center. A soliton wave could be used as a sort of invisible set of bowling alley bumpers to make sure that the high-energy beam at the center doesn't veer off-course.

Conclusion

If successful, such a system would be capable of instigating structural fires from space, inducing cancers and even doing more subtle things like putting pinholes in pressurized water reactors in subs while they are surfaced, resulting in inexplicable meltdowns which would likely be ruled accidental by any navy.

Note: This was written prior to the publication of 19 October 2023 in which a more practical method of ongoing beam confinement; Prismatic Light Helicization; was proposed. While that method may be superior for IR and visible light, the confinement of X-Rays is far more challenging as a prismatic approach is unlikely to be viable. Soliton sheathing likely remains the most practical method for ensuring the collimation of weaponized X-Ray beams.